**What is Number Cruncher?**

This activity allows the user to explore simple linear functions; the function is determined by looking for patterns in the outputs. Whole Number Cruncher records each input and output in a window. The functions available for exploration in the function machine activity have one of the following forms:

y = x \* \_\_   
y = x + \_\_   
y = x - \_\_

The notion of a function is important in higher mathematics such as calculus and in areas which use mathematics such as physics. Any rule that assigns exactly one output to an input or list of inputs can be called a function.

Here are a few examples:

* Input the number of seconds after the starting gun in a race to get an output of the number of meters the runner has covered.

|  |  |  |  |
| --- | --- | --- | --- |
| seconds | 3 | 5 | 0 |
| meters | 8 | 10 | 0 |

* y = 6\*x, where x is the place holder (also called a variable) for the input and y is the place holder for the output.

|  |  |  |  |
| --- | --- | --- | --- |
| x | 3 | 5 | 0 |
| y | 18 | 30 | 0 |

The rule about only one output each time is crucial and must not be violated. For example, the table below cannot represent a function because 3 has two different outputs:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| input | 3 | 2 | 0 | 3 |
| output | 4 | -1 | 2 | -3 |

**NOT A FUNCTION**

Retrieved from: http://www.shodor.org/interactivate/activities/NumberCruncher/